

## CLAIMS

- 5 1. A method of operating a communications network comprising:
- a) measuring at each of a plurality of customer terminals usage by the respective customer terminal of network resources; and
  - b) subsequently calculating a network usage charge from the measurement data generated by step (a).
- 10 2. A method of operating a federated data communications network characterised by measuring at each of a plurality of customer terminals connected to the said network usage by the respective customer terminal of network resources.
- 15 3. A method according to claim 2, further comprising subsequently calculating a network usage charge from measurement data generated by the step of measuring.
- 20 4. A method according to any one of the preceding claims, further comprising a step of aggregating measurement data produced by a series of measurements at respective customer terminal.
- 25 5. A method according to any one of the preceding claims, further comprising storing the measurement data.
6. A method according to claim 5, including storing with the measurement data data identifying a tariff applicable to the said measurement data.
- 30 7. A method according to any one of the preceding claims including communicating data generated by step (a) to a network accounting object controlled by a network operator.
8. A method according to claim 7, including communicating to the network accounting object a usage charge calculated from the measurement data.

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9. A method according to any one of the preceding claims, including communicating measurement data to a system remote from the customer terminal.

10. A method according to any one of the preceding claims, including a step carried out by the network operator of sampling part only of the traffic communicated between a customer terminal and the network and for the sampled traffic comparing the network usage with data communicated from the customer terminal to the network accounting object and thereby detecting any discrepancy.

11. A method according to any one of the preceding claims in which a network accounting object is configurable to receive data from a measurement object controlled by the network operator or from a customer terminal.

12. A method according to claim 11, in which a customer accounting object associated with the customer terminal is configurable to direct data to the network accounting object.

13. A method according to claim 11 or 12, including switching the network accounting object from a first configuration in which data is received from the said measurement object and another configuration in which data is received from the customer terminal in response to a control signal received at the network accounting object.

14. A method according to any one of the preceding claims further comprising communicating a tariff to each of the customer terminals, and calculating at each of the terminals from the tariff and from the accounting data the network usage charge.

15. A method according to any one of the preceding claims in which the communications network is a federated data network comprising a plurality of network domains.

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16. A method according to claim 15 including

communicating traffic between a customer terminal and a first network domain connected to the customer terminal,

further communicating the said traffic between the first network domain  
5 and a second network domain connected to the first network domain;

communicating network usage data from the customer terminal to a first network accounting object in the first domain;

communicating accounting data between the first network accounting object and a second network accounting object in the second domain.

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17. A method according to claim 16, including determining from a current routing table in the first network domain the identity of a second domain, which second domain is communicating data with the customer terminal via the first network domain, and communicating network usage data for the customer terminal to the

15 second domain identified by the current routing table.

18. A method according to any one of the preceding claims in which the step of measuring includes counting the quantity of data communicated in packets transmitted between the customer terminal and the communications network.

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19. A method according to claim 18, including measuring both packets received by the customer terminal and packets sent by the customer terminal.

20. A method according to any one of the preceding claims, in which a payment  
25 for network usage is made to a third-party clearer.

21. A method according to any one of claims 1 to 20, including automatically varying a tariff for network usage in dependence on loading of the network, and calculating a charge for network usage by applying the tariff to the measurement  
30 data.

22. A method according to anyone of the preceding claims, including transmitting packets on the network with a plurality of different classes of service.

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23. A method according to claim 22, including passing the said packets through a packet router, and in the packet router determining the classes of service applicable to the packets, and scheduling packets differently depending on the respective class of service.

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24. A method according to claim 23, in which a step of policing the classification of packets to determine the eligibility of a packet for a respective class of service is carried out at a location remote from the router.

10 25. A method according to claim 24, in which the step of policing is carried out at a customer terminal.

26. A method of operating a packet network providing a plurality of different service levels, the method including passing the said packets through a packet  
15 router, and in the packet router determining a class of service for packets, scheduling packets differently depending on the respective class of service and, at a location remote from the router, policing the class of service levels of packets to determine the eligibility of a packet for a respective class of service.

20 27. A method of operating a federated communications network comprising a plurality of network domains, the method including determining a price for a data transmission between one domain and an adjacent domain by:

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- a) announcing, by the one domain, both a price for receiving the data from the adjacent domain and a price for transmitting data into the adjacent domain;
  - b) announcing, by the adjacent domain, both a price for receiving data from the one domain and a price for transmitting data into the one domain;
  - c) calculating an edge price for the data transmission from the difference  
30 between either the price for receiving announced in step (a) and the price for transmitting announced in step (b) or the price for transmitting announced in step (a) and the price for receiving announced in step (b), depending on the direction of transmission of the data.

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28. A method according to Claim 27, in which each of the domain announces a plurality of different sets of prices corresponding to different respective classes of service.

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29. A method of operating a communications network including:

- (a) establishing a data flow from an originating customer connected to the network to at least one destination customer connected to the or each network;
- 10 (b) communicating tariff data from the or each network operator to a clearing entity;
- (c) communicating tariff data for end-to-end flow from the clearing entity to at least one of the originating and destination customers;
- (d) measuring the quantity of data flowing from the originating customer  
15 into the network and the quantity of data flowing out of the network to the destination customer;
- (e) communicating measurement data generated by step d to the clearing entity;
- (f) at the clearing entity calculating a charge from the measurement  
20 data and the tariff;
- (g) making a payment from the clearing entity to the network operator in accordance with the calculated charge; and
- (h) communicating a bill in accordance with the end-to-end tariff from  
25 the clearing entity to at least one of the originating customer and the destination customer.

30. A method according to claim 10, or any one of the preceding claims when dependent on claim 10, including penalising a customer when a discrepancy is detected.

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31. A method of operating a network comprising a plurality of network domains, including calculating a charge for use of network resources in the transmission of traffic from a first customer via the network to a second customer comprising:

- a) determining a cost dependent on network resources used in the transmission;
- b) determining a cost apportionment parameter for the first and second customers;
- 5 c) calculating charges for one or both of the first and second customers by combining the cost and the apportionment parameter.

32. A communications network arranged to operate by a method according to anyone of the preceding claims.

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33. A customer terminal arranged to operate by a method according to any one of the claims 1 to 32.

34. A customer terminal including a data interface arranged to be connected to  
15 a federated data network, characterised by a network usage meter arranged to measure the usage by the customer terminal of network resources.

35. A customer terminal according to claim 34, in which the usage meter includes means for counting the quantity of data in packets communicated between the customer terminal and the network via the data interface.

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36. A customer terminal according to claim 34 to 35, including an accounting interface arranged to communicate measurement data to a network accounting object.

25 37. A router for use in a packet network providing a plurality of different service levels, the router comprising

means for determining the class of a packet received at a router,

means for scheduling a packet depending on its class,

in which the router is arranged to schedule packets depending on their class

30 without policing the eligibility of a packet for a requested class of service.

38. A method of pricing data flows in a federated data network substantially as described with respect to Figure 11.

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39. A method according to claim 25 or 26, in which the policing by the customer is randomly audited concurrently with, or subsequently to, the respective data flow.

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